

ABSTRACT OF THE DISCLOSURE

Matching layers are provided, including: electrically conductive acoustic matching layers, methods for conducting electric current through matching layers, methods for manufacturing multi-dimensional arrays using conductive matching layers, and multi-dimensional arrays with electrically conducting matching layers. Matching layers with conductors aligned for providing electrical conduction through the thickness or range dimension of the matching layer are provided. For example, vias, aligned magnetic particles, or conductive films at least partially or entirely within the matching layer of each element allow electrical conduction from the transducer material to a ground foil or flex circuit. By using multiple electrical conductive matching layers, a gradation in acoustic impedance for better matching is provided while allowing dicing of the entire stack, including the matching layers and the electroceramic material, in one step.